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(54) **VARIOUS WAYS TO AUTOMATICALLY SELECT SHARING SETTINGS**

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CPC ***G06N 5/04*** (2013.01); *G06N 99/005* (2013.01)

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CPC G06N 99/00
See application file for complete search history.

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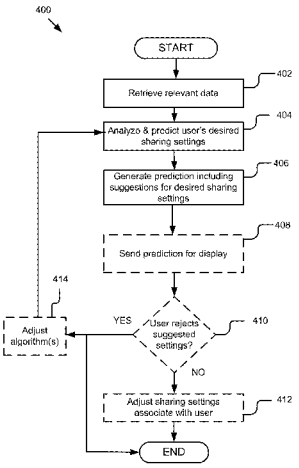
(57) **ABSTRACT**

A system and method for predicting one or more sharing settings for a social network user is provided. The relevant user data is received and analyzed. Based on the analysis of the relevant user data, one or more of the user's desired sharing settings is predicted. In some embodiments, statistical analysis is used to analyze and/or predict the user's desired sharing settings. One or more predictions including a suggested sharing setting are generated. In one embodiment, the user's sharing settings are automatically adjusted based on the one or more predictions. In one embodiment, the one or more predictions are sent for display to the user. In one embodiment, feedback is obtained from the user accepting or rejecting the predictions. In one embodiment, the feedback is used to adjust one or more of the algorithms for analyzing the user data, predicting the user's desired sharing settings, or both.

31 Claims, 9 Drawing Sheets



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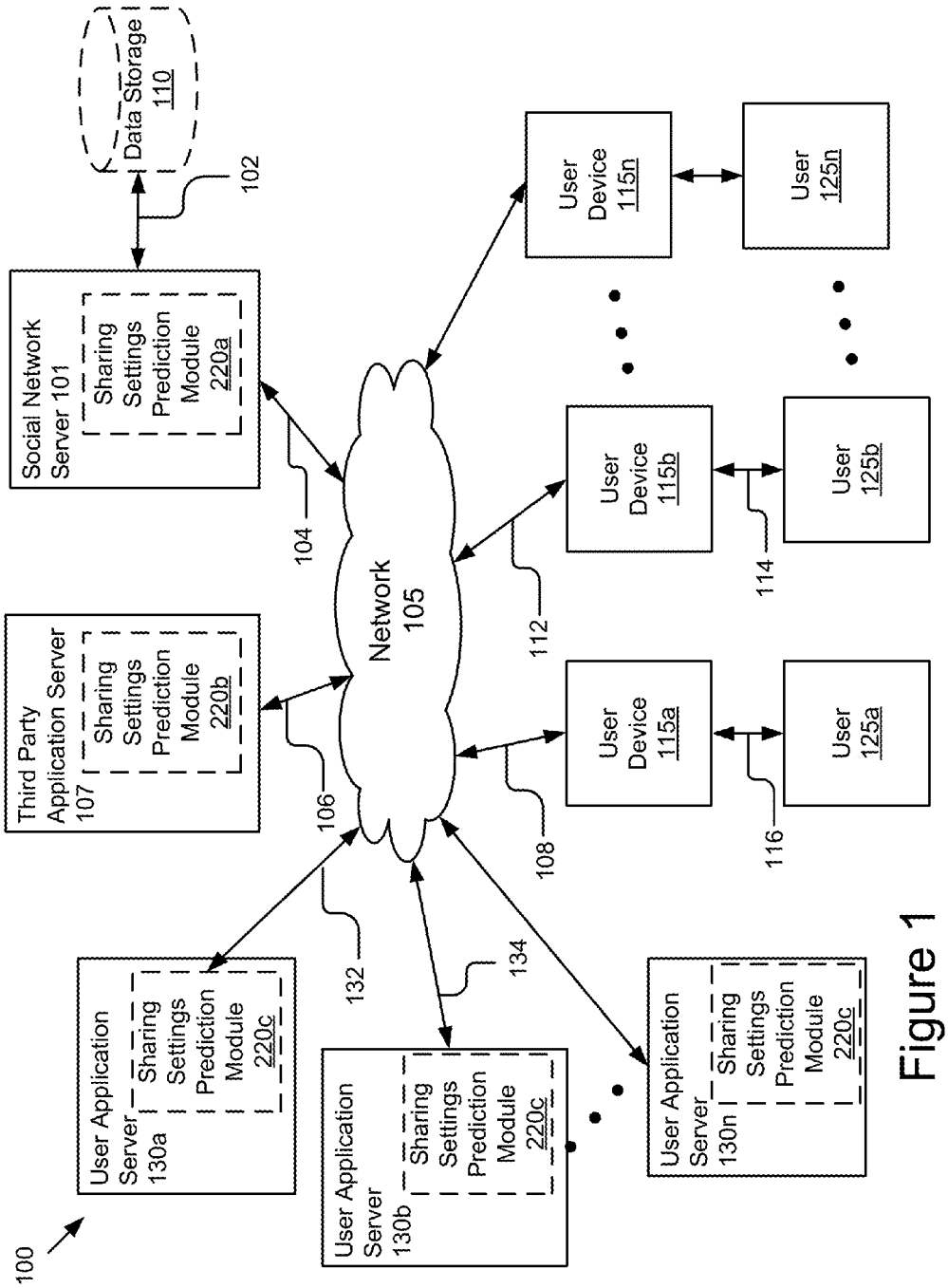
Data Storage 110
102
Social Network Server 101
Sharing Settings Prediction Module 220a
Third Party Application Server 107
Sharing Settings Prediction Module 220b
User Application Server 130a
Sharing Settings Prediction Module 220c
User Application Server 130b
Sharing Settings Prediction Module 220c
User Application Server 130n
Sharing Settings Prediction Module 220c
Network 105
104
106
108
112
114
116
132
134
User Device 115n
User Device 115b
User Device 115a
User 125n
User 125b
User 125a
100

Figure 1

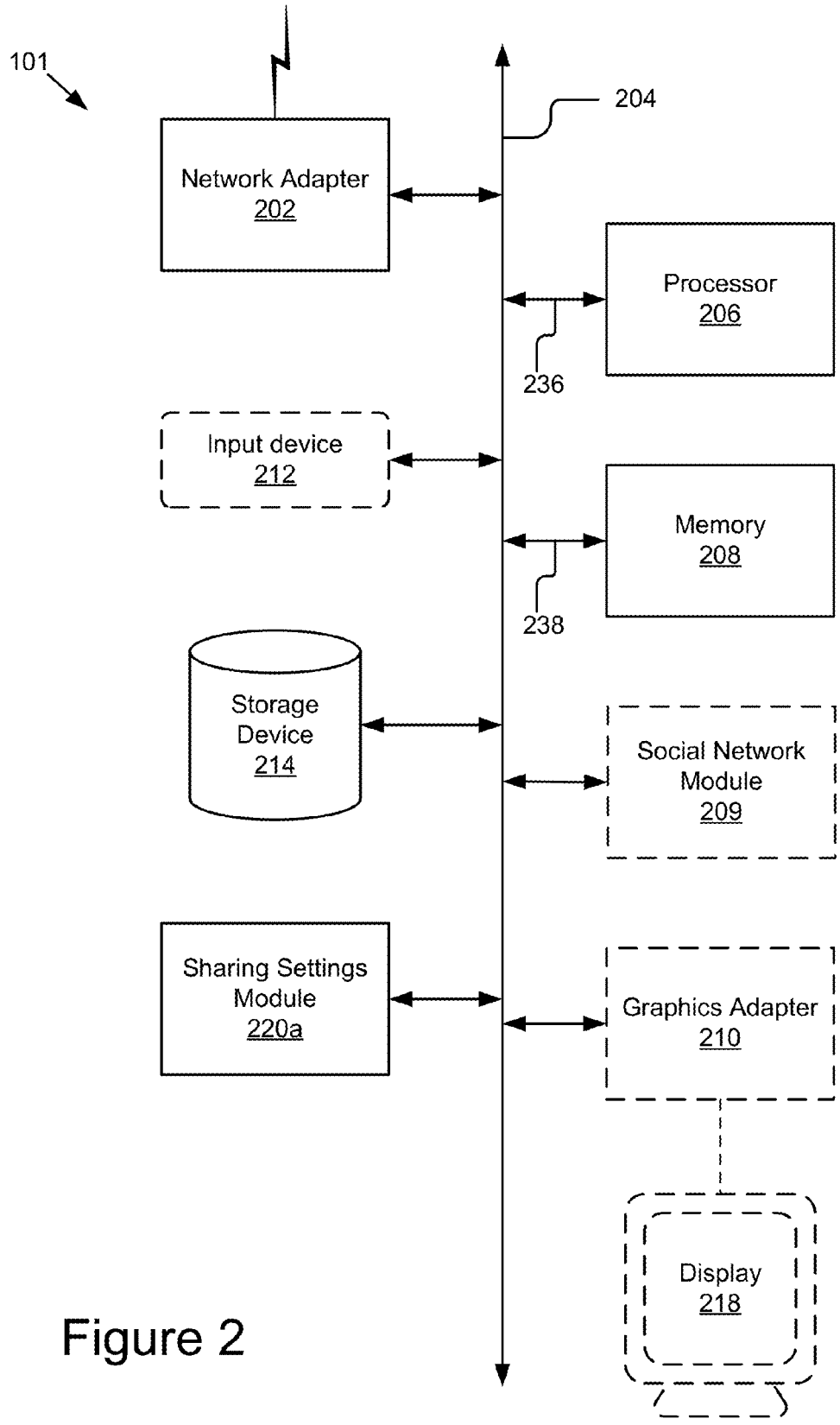
101
204
Network Adapter
202
Processor
206
236
Input device
212
Memory
208
238
Storage
Device
214
Social Network
Module
209
Sharing Settings
Module
220a
Graphics Adapter
210
Display
218

Figure 2

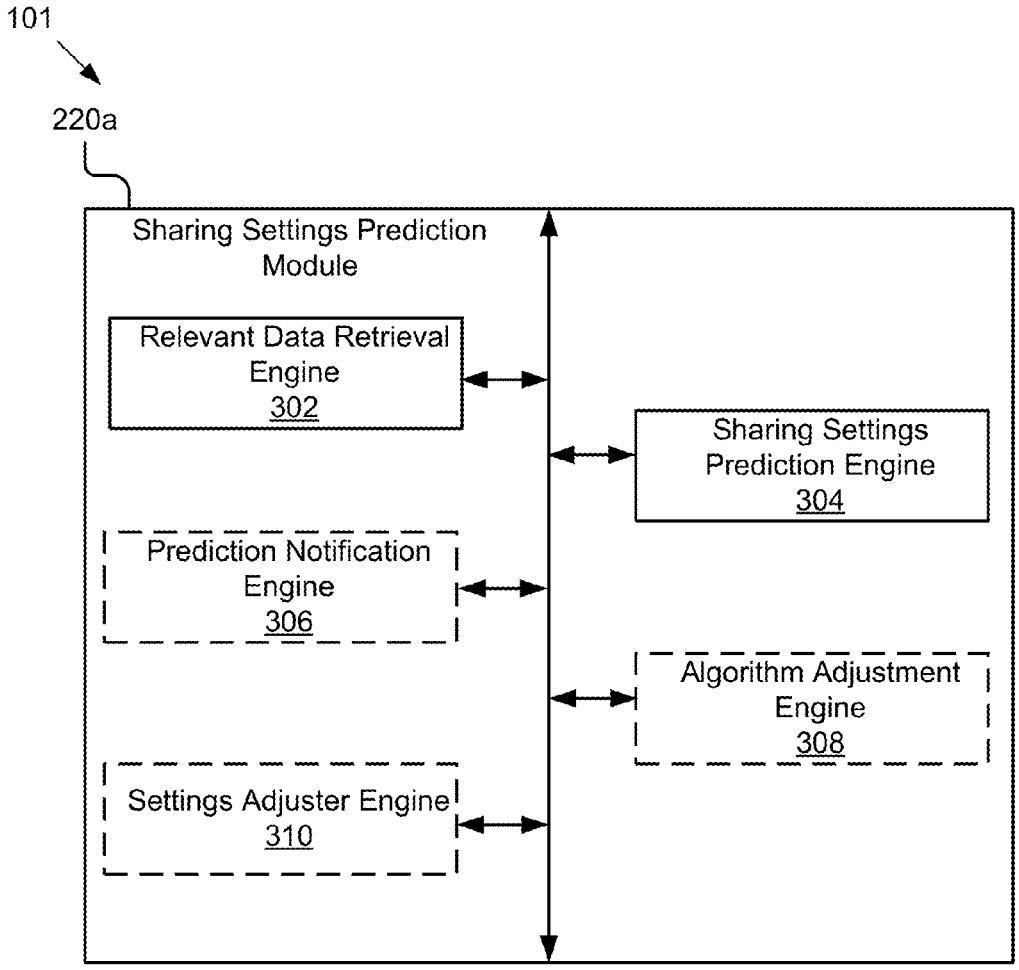
101
220a
Sharing Settings Prediction Module
Relevant Data Retrieval Engine 302
Sharing Settings Prediction Engine 304
Prediction Notification Engine 306
Algorithm Adjustment Engine 308
Settings Adjuster Engine 310

Figure 3

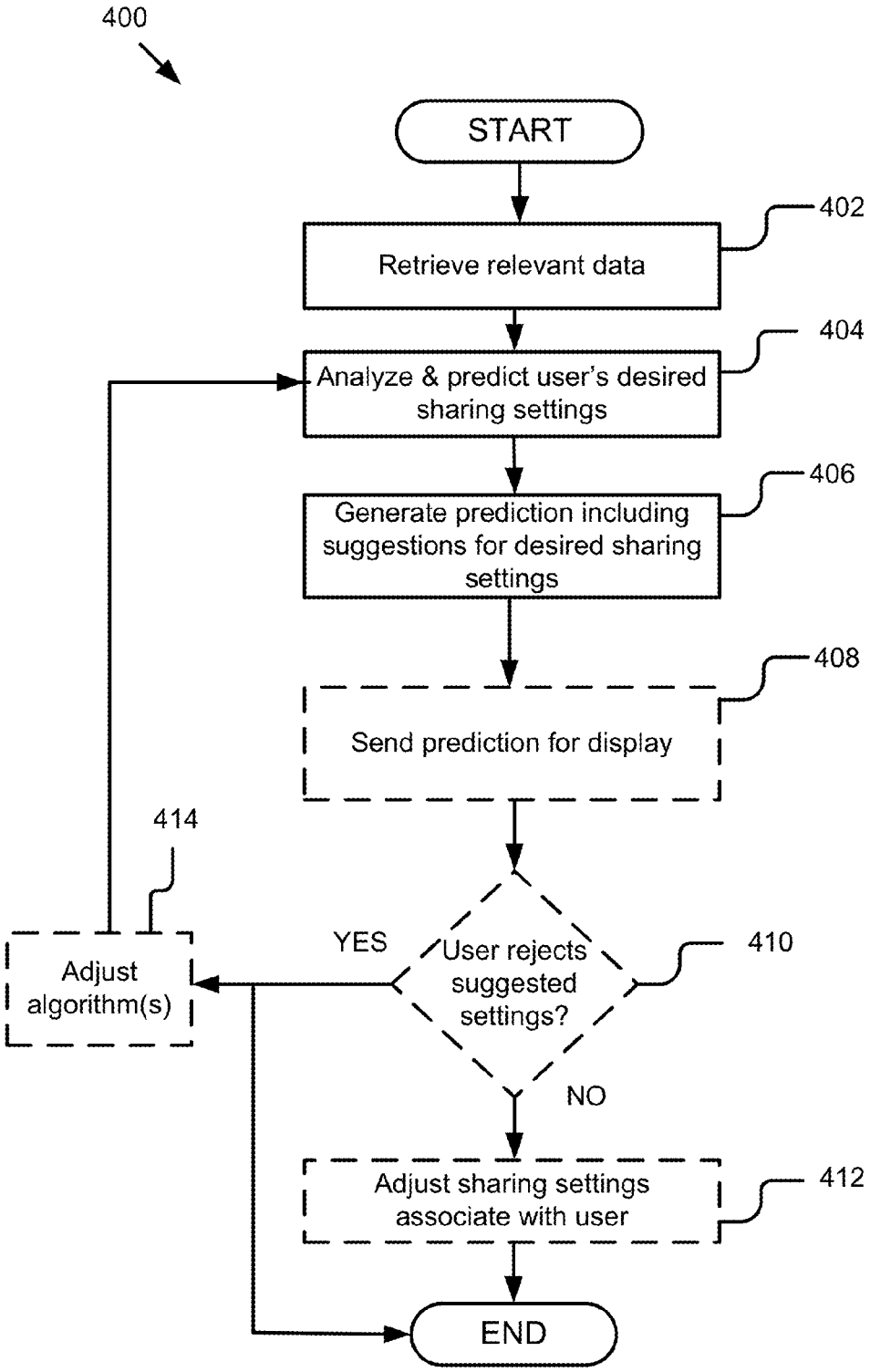
400
START
Retrieve relevant data
402
Analyze & predict user's desired sharing settings
404
Generate prediction including suggestions for desired sharing settings
406
Send prediction for display
408
User rejects suggested settings?
410
YES
NO
Adjust algorithm(s)
414
Adjust sharing settings associate with user
412
END

Figure 4

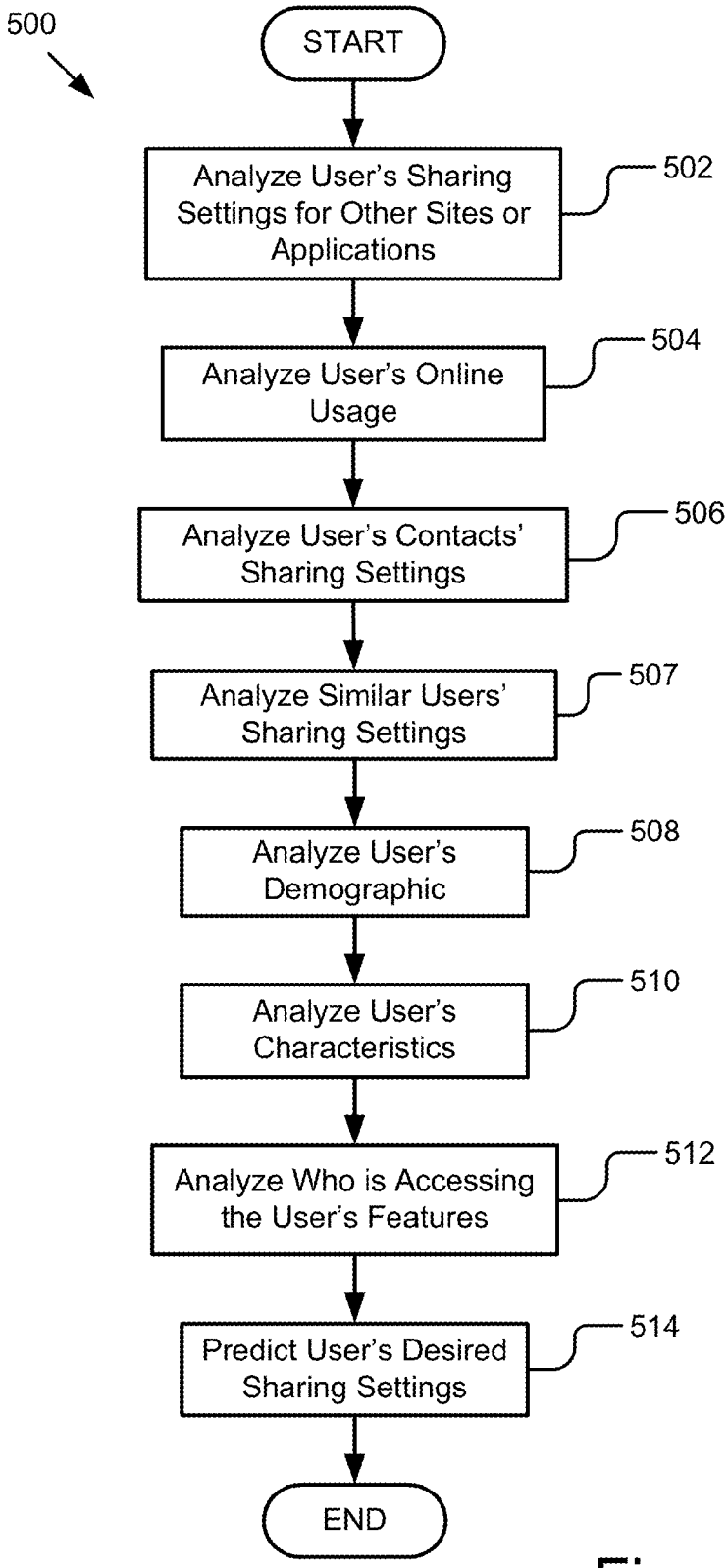
500
START
Analyze User's Sharing Settings for Other Sites or Applications
502
Analyze User's Online Usage
504
Analyze User's Contacts' Sharing Settings
506
Analyze Similar Users' Sharing Settings
507
Analyze User's Demographic
508
Analyze User's Characteristics
510
Analyze Who is Accessing the User's Features
512
Predict User's Desired Sharing Settings
514
END

Figure 5

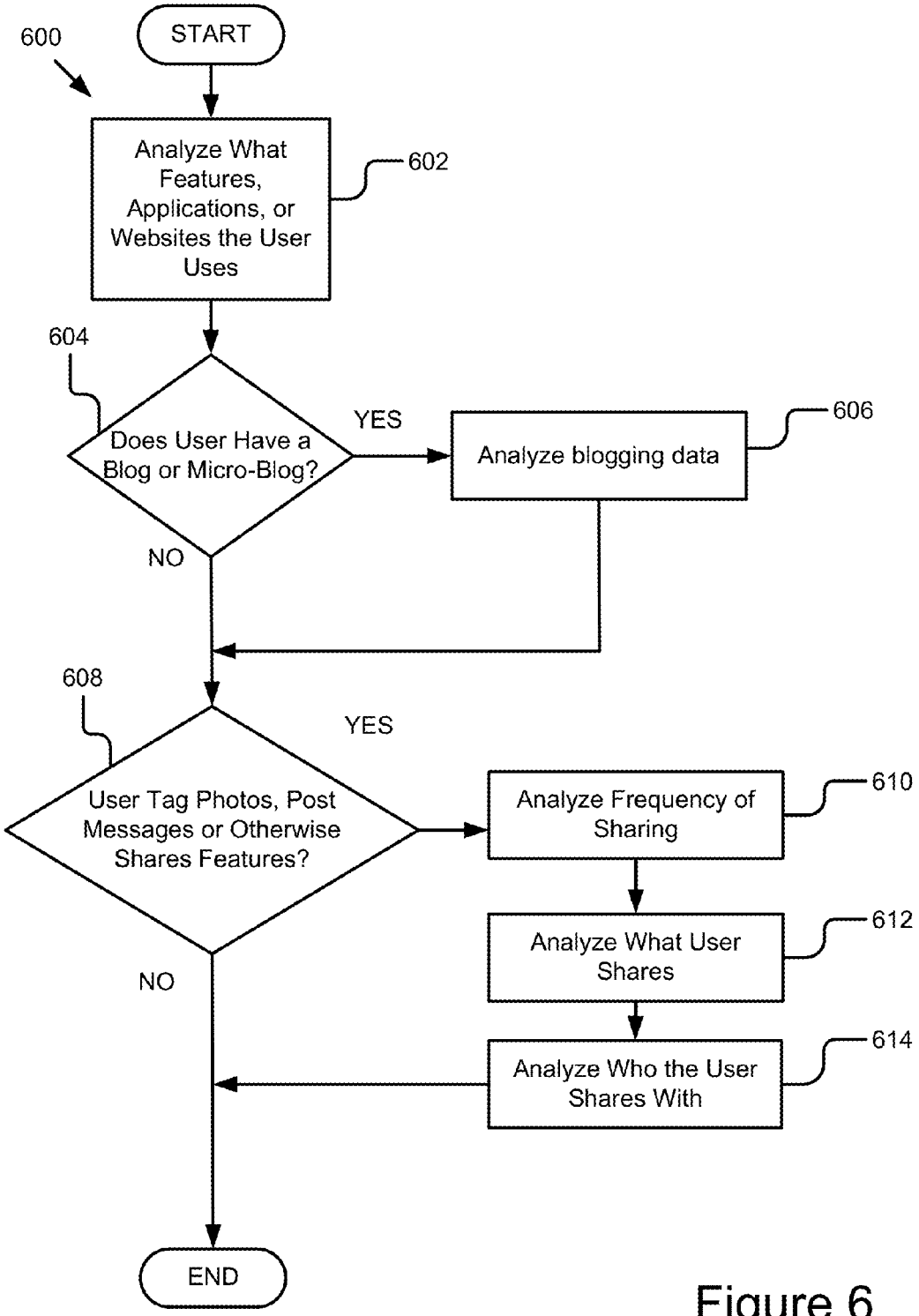
600
START
Analyze What Features, Applications, or Websites the User Uses
602
604
Does User Have a Blog or Micro-Blog?
YES
Analyze blogging data
606
NO
608
User Tag Photos, Post Messages or Otherwise Shares Features?
YES
Analyze Frequency of Sharing
610
Analyze What User Shares
612
NO
Analyze Who the User Shares With
614
END

Figure 6

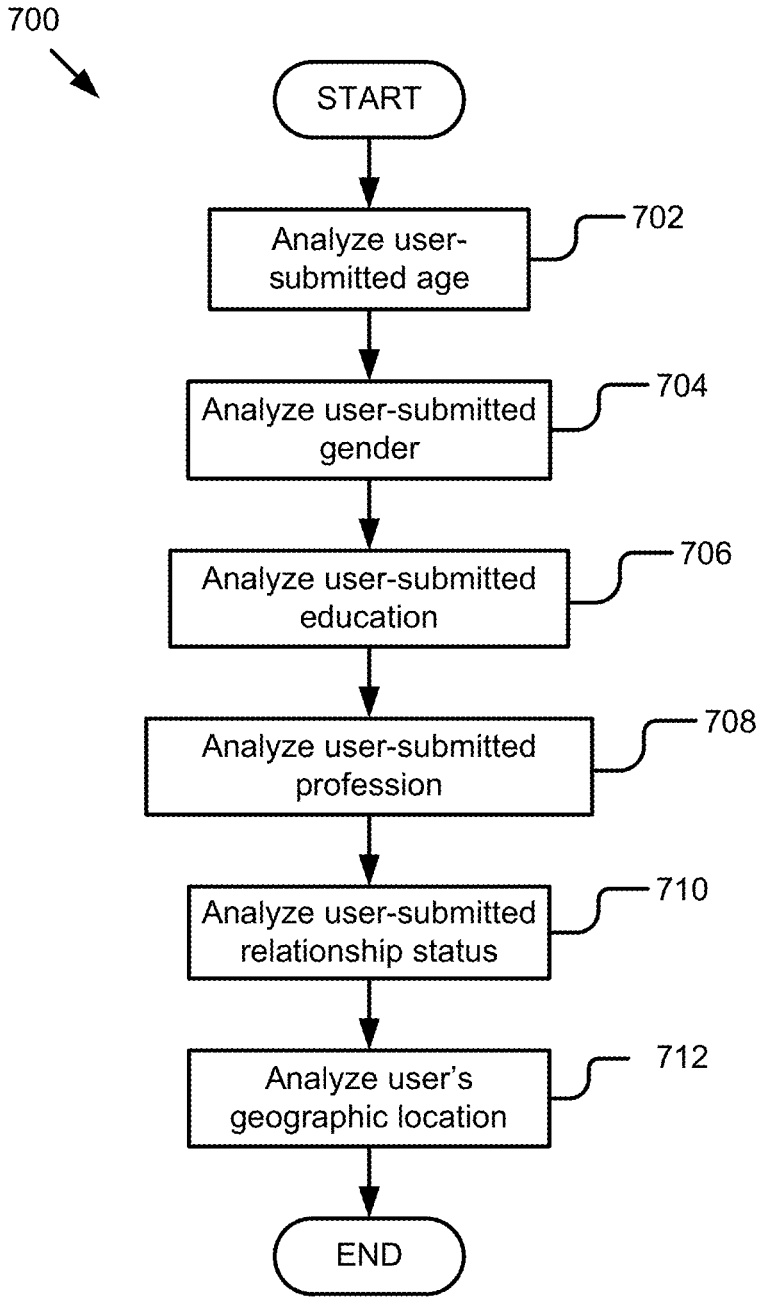
700
START
Analyze user-submitted age
702
Analyze user-submitted gender
704
Analyze user-submitted education
706
Analyze user-submitted profession
708
Analyze user-submitted relationship status
710
Analyze user's geographic location
712
END

Figure 7

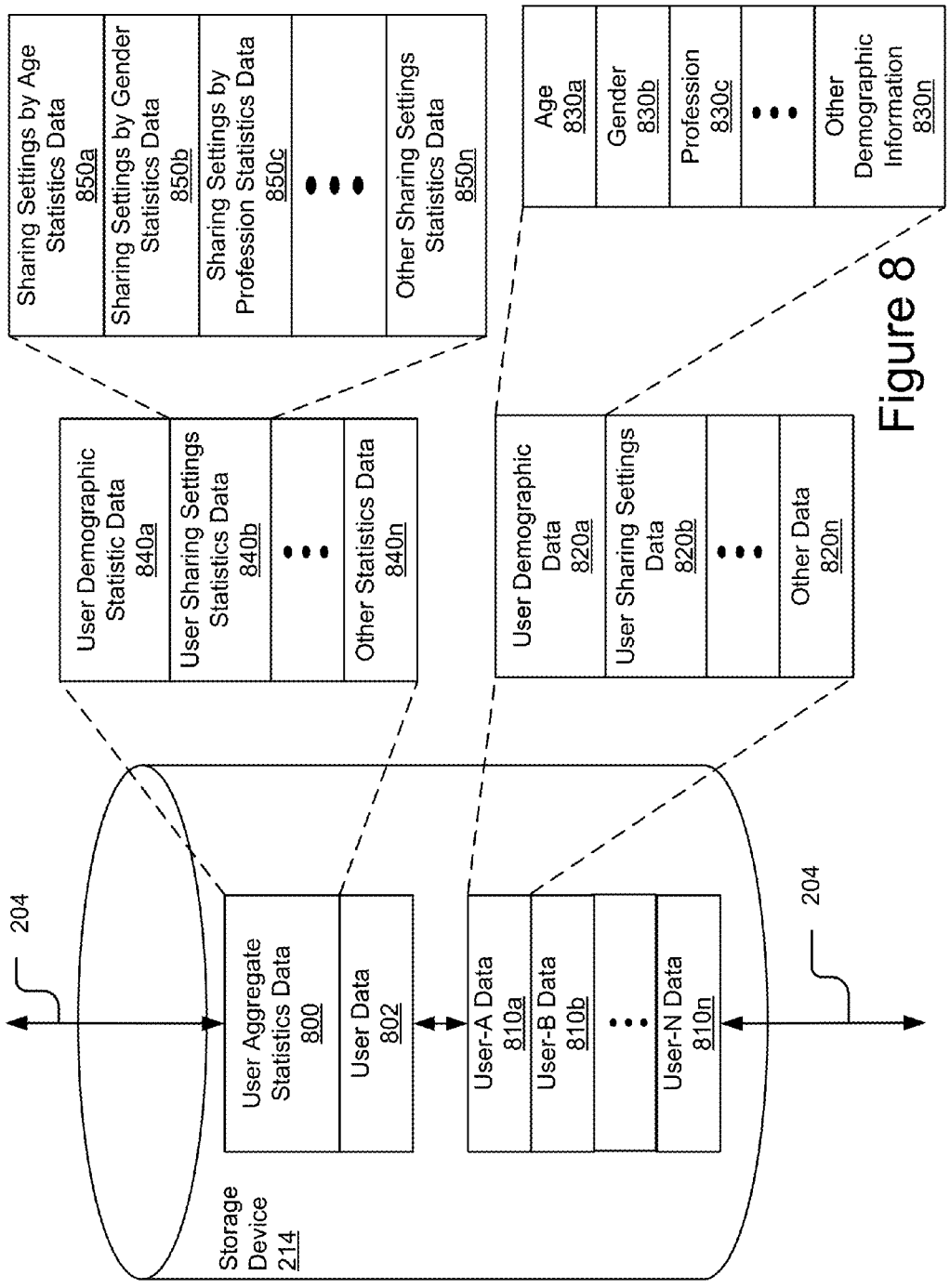
Storage Device 214
User Aggregate Statistics Data 800
User Data 802
User-A Data 810a
User-B Data 810b
User-N Data 810n
204
204
User Demographic Statistic Data 840a
User Sharing Settings Statistics Data 840b
Other Statistics Data 840n
User Demographic Data 820a
User Sharing Settings Data 820b
Other Data 820n
Sharing Settings by Age Statistics Data 850a
Sharing Settings by Gender Statistics Data 850b
Sharing Settings by Profession Statistics Data 850c
Other Sharing Settings Statistics Data 850n
Age 830a
Gender 830b
Profession 830c
Other Demographic Information 830n

Figure 8

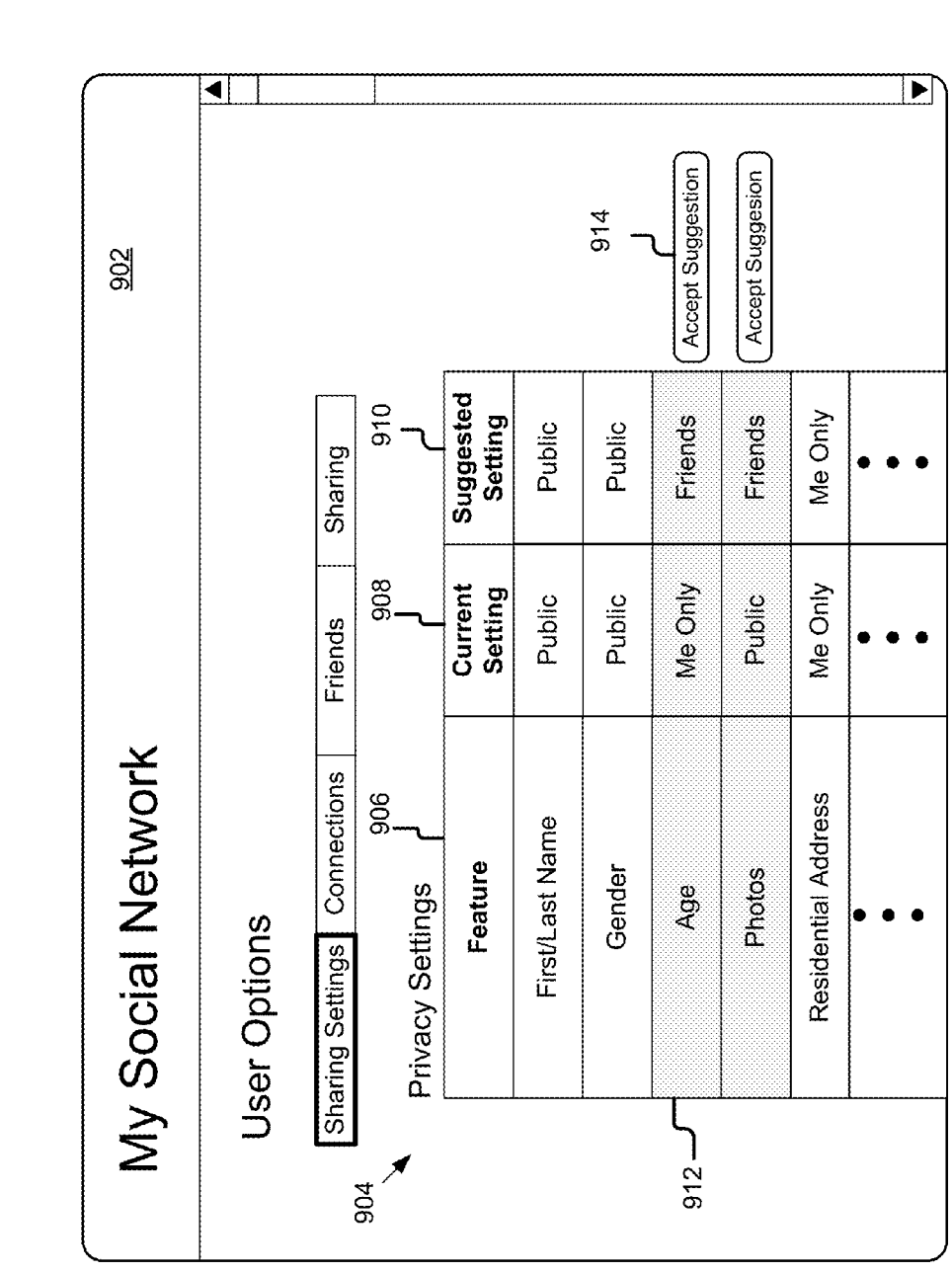
900
My Social Network
902
User Options
Sharing Settings
Connections
Friends
Sharing
904
Privacy Settings
906
908
910
Feature
Current Setting
Suggested Setting
First/Last Name
Public
Public
Gender
Public
Public
912
Age
Me Only
Friends
914
Accept Suggestion
Photos
Public
Friends
Accept Suggesion
Residential Address
Me Only
Me Only

Figure 9

VARIOUS WAYS TO AUTOMATICALLY SELECT SHARING SETTINGS

The specification relates to social networks. In particular, the present specification relates to sharing settings on social networks. Still more particularly, the present specification relates to predicting one or more of a user's desired sharing settings based on an analysis of the user's relevant data.

BACKGROUND

Social networks are becoming an increasingly popular way for people to stay connected. This increasing popularity of social networks has given rise to social network services that have developed various ways users of the social network can communicate and share information. Users within a social network can send each other messages, view other users' activities, and share personal information, including personal photographs and videos. Social networking services can provide a forum for users to remain in close contact despite geographic distance or uncoordinated schedules. Further, the development of other online services that enable the general sharing of information has also increased. Users are typically able to adjust the amount and type of information they chose to share and how and with whom that information is shared. However, a user may neglect to alter the default sharing settings to settings that better match the user's desire for privacy or accessibility when creating a social network account or a user may neglect to adjust the sharing settings periodically as the user's needs and usage change.

SUMMARY OF THE INVENTION

The deficiencies and limitations of the prior art are overcome at least in part by providing a system and method for predicting one or more of a user's desired sharing settings based on an analysis of the user's relevant data.

An embodiment provides a computer-implemented method for predicting one or more sharing settings for a social network user. The relevant user data is received and analyzed. Based on the analysis of the relevant user data, one or more of the user's desired sharing settings is predicted. In some embodiments, statistical analysis is used to analyze the relevant user data and/or predict the user's desired sharing settings. One or more predictions including a suggested sharing setting are generated. In one embodiment, the user's sharing settings are automatically adjusted based on the one or more predictions. In one embodiment, the one or more predictions are sent for display to the user. In one embodiment, feedback is obtained from the user accepting or rejecting the predictions. In one embodiment, the feedback is used to adjust one or more of the algorithms for analyzing the user data, predicting the user's desired sharing settings, or both.

Another embodiment provides a system for predicting one or more sharing settings for a social network user. The system includes a processor, and at least one module, stored in the memory and executed by the processor. The module including instructions for receiving relevant user data; analyzing the relevant user data; predicting one or more of the user's desired sharing settings based on the analysis of the relevant user data; generating one or more predictions, wherein the prediction includes a suggestion of a desired sharing setting; and, depending on the embodiment, either sending the one or more predictions for display, or automatically adjusting the user's sharing settings according to the one or more predictions. In one embodiment, instructions for obtaining feedback when the user accepts or rejects the predictions are included. In one embodiment, instructions for using the feedback to adjust one or more of the algorithms for analyzing the user data, predicting the user's desired sharing settings, or both are included.

Yet another embodiment provides a graphical user interface for predicting one or more sharing settings for a user. The graphical user interface displays the one or more predictions, wherein the prediction includes a suggestion of at least one desired sharing setting. In one embodiment, the graphical user interface also displays the user's current sharing setting for each of the predictions. In one embodiment, the graphical user interface is displayed as a portion of a user's social network webpage. In another embodiment, the graphical user interface is displayed as a pop-up window.

BRIEF DESCRIPTION OF THE DRAWINGS

The embodiments are illustrated by way of example, and not by way of limitation in the figures of the accompanying drawings in which like reference numerals are used to refer to similar elements.

FIG. **1** illustrates a block diagram of a system for predicting one or more of a user's desired sharing settings based on an analysis of the user's relevant data according to one embodiment.

FIG. **2** is a block diagram of an embodiment of a social network server in accordance with one embodiment.

FIG. **3** is a block diagram illustrating a sharing settings prediction module according to one embodiment.

FIG. **4** is a flow chart illustrating a method for predicting one or more of a user's desired sharing settings based on an analysis of the user's relevant data according to one embodiment.

FIG. **5** is a flowchart illustrating a method for analyzing a user's relevant data and predicting a user's desired sharing settings according to one embodiment.

FIG. **6** is a flowchart illustrating a method for analyzing the user's online usage according to one embodiment.

FIG. **7** is a flowchart illustrating a method for analyzing the user's demographic according to one embodiment.

FIG. **8** illustrates a storage device storing user data including relevant data regarding the user's demographic and aggregate statistics data according to one embodiment.

FIG. **9** is a graphic representation of an example of a user interface displaying the user's sharing settings and the predicted sharing settings according to one embodiment.

DETAILED DESCRIPTION

A system and method for predicting one or more of a user's desired sharing settings based on an analysis of the user's relevant data is described. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding. It will be apparent, however, to one skilled in the art that the embodiments can be practiced without these specific details. In other instances, structures and devices are shown in block diagram form in order to avoid obscuring the embodiments. For example, one embodiment is described below with reference to user interfaces and particular hardware. However, the embodiments apply to any type of computing device that can receive data and commands, and any peripheral devices providing services.

Reference in the specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. The appearances of

the phrase "in one embodiment" in various places in the specification are not necessarily all referring to the same embodiment.

Some portions of the detailed descriptions that follow are presented in terms of algorithms and symbolic representations of operations on data bits within a computer memory. These algorithmic descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers or the like.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as apparent from the following discussion, it is appreciated that throughout the description, discussions utilizing terms such as "processing" or "computing" or "calculating" or "determining" or "displaying" or the like, refer to the action and processes of a computer system, or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

The present embodiments also relate to an apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, or it may comprise a general-purpose computer selectively activated or reconfigured by a computer program stored in the computer. Such a computer program may be stored in a computer readable storage medium, such as, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, and magnetic disks, read-only memories (ROMs), random access memories (RAMs), EPROMs, EEPROMs, magnetic or optical cards, flash memories including USB keys with non-volatile memory or any type of media suitable for storing electronic instructions, each coupled to a computer system bus.

The embodiments can take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment containing both hardware and software elements. A preferred embodiment is implemented in software, which includes but is not limited to firmware, resident software, microcode, etc.

Furthermore, one embodiment can take the form of a computer program product accessible from a computer-usable or computer-readable medium providing program code for use by or in connection with a computer or any instruction execution system. For the purposes of this description, a computer-usable or computer readable medium can be any apparatus that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device.

A data processing system suitable for storing and/or executing program code will include at least one processor coupled directly or indirectly to memory elements through a system bus. The memory elements can include local memory employed during actual execution of the program code, bulk storage, and cache memories which provide temporary storage of at least some program code in order to reduce the number of times code must be obtained from bulk storage during execution.

Input/output or I/O devices (including but not limited to keyboards, displays, pointing devices, etc.) can be coupled to the system either directly or through intervening I/O controllers.

Network adapters may also be coupled to the system to enable the data processing system to become coupled to other data processing systems or remote printers or storage devices through intervening private or public networks. Modems, cable modem and Ethernet cards are just a few of the currently available types of network adapters.

Finally, the algorithms and displays presented herein are not inherently related to any particular computer or other apparatus. Various general-purpose systems may be used with programs in accordance with the teachings herein, or it may prove convenient to construct more specialized apparatus to perform the required method steps. The required structure for a variety of these systems will appear from the description below. In addition, the present embodiments are not described with reference to any particular programming language. It will be appreciated that a variety of programming languages may be used to implement the teachings as described herein.

System Overview

FIG. **1** illustrates a block diagram of a social network system **100** for predicting one or more of a user's desired sharing settings based on an analysis of the user's relevant data according to one embodiment. In some embodiments, the sharing settings are the settings within a user's social network that controls who sees what information on that user's social network. For example, if a user sets his or her sharing settings to all the information being public, then everyone will be able to view that user's information. In some embodiments, users can set the sharing settings to allow certain users to view some information and allow other users to view other information on the user's social network.

The illustrated embodiment of the social network system **100** for predicting one or more of a user's desired sharing settings based on an analysis of the user's relevant data includes user devices **115***a*, **115***b*, **115***n* that are accessed by users **125***a*, **125***b*, **125***n*, a social network server **101** and a third party server **107**. The system **100** also includes user application servers **130***a*, **130***b*. In the illustrated embodiment, these entities are communicatively coupled via a network **105**. Although only three devices are illustrated, persons of ordinary skill in the art will recognize that any number of user devices **115***n* are available to any number of users **125***n*. Further, although only two user application servers **130***a*, **130***b* are illustrated, persons of ordinary skill in the art will recognize that any number of user application servers **130***n* are available.

The user devices **115***a*, **115***b*, **115***n* and user application servers **130***a*, **130***b* in FIG. **1** are used by way of example. While FIG. **1** illustrates two devices, the embodiment applies to any system architecture having one or more user devices and one or more user application servers. Furthermore, while only one network **105** is coupled to the user devices, **115***a*, **115***b*, **115***n*, the social network server **101** and the third party server **107**, in practice any number of networks **105** can be connected to the entities. Furthermore, while only one third party application server **107** is shown, the system **100** could include one or more third party application servers **107**.

The social network server **101** also contains a social network module **209**. Although only one social network server **101** is shown, persons of ordinary skill in the art will recognize that multiple servers may be present. A social network is any type of social structure where the users are connected by a common feature. Examples include, but are not limited to, Orkut, Buzz, blogs, microblogs, and Internet forums. The common feature includes friendship, family, a common interest, etc. The common feature includes friendship, family, work, an interest, etc.

The network **105** enables communications between user devices **115***a*, **115***b*, **115***n*, and **115***n*, the social network server **101**, the third party application **107** and user application servers **130***a*, **130***b*, and **130***n*. Thus, the network **105** can include links using technologies such as Wi-Fi, Wi-Max, 2G, Universal Mobile Telecommunications System (UMTS), 3G, Ethernet, 802.11, integrated services digital network (ISDN), digital subscriber line (DSL), asynchronous transfer mode (ATM), InfiniBand, PCI Express Advanced Switching, etc. Similarly, the networking protocols used on the network **105** can include the transmission control protocol/Internet protocol (TCP/IP), multi-protocol label switching (MPLS), the User Datagram Protocol (UDP), the hypertext transport protocol (HTTP), the simple mail transfer protocol (SMTP), the file transfer protocol (FTP), lightweight directory access protocol (LDAP), Code Division Multiple Access (CDMA), Wideband Code Division Multiple Access (WCDMA), Global System for Mobile communications (GSM), High-Speed Downlink Packet Access (HSDPA), etc. The data exchanged over the network **105** can be represented using technologies and/or formats including the hypertext markup language (HTML), the extensible markup language (XML), etc. In addition, all or some of links can be encrypted using conventional encryption technologies such as the secure sockets layer (SSL), Secure HTTP and/or virtual private networks (VPNs) or Internet Protocol security (IPsec). In another embodiment, the entities can use custom and/or dedicated data communications technologies instead of, or in addition to, the ones described above. Depending upon the embodiment, the network **105** can also include links to other networks.

In one embodiment, the network **105** is a partially public or a wholly public network such as the Internet. The network **105** can also be a private network or include one or more distinct or logical private networks (e.g., virtual private networks, Wide Area Networks ("WAN") and/or Local Area Networks ("LAN")). Additionally, the communication links to and from the network **105** can be wireline or wireless (i.e., terrestrial- or satellite-based transceivers). In one embodiment, the network **105** is an IP-based wide or metropolitan area network.

In some embodiments, the network **105** helps to form a set of online relationships between users **125***a*, **125***b*, and **125***n*, such as provided by one or more social networking systems, such as social network system **100**, including explicitly-defined relationships and relationships implied by social connections with other online users, where the relationships form a social graph. In some examples, the social graph can reflect a mapping of these users and how they are related.

In one embodiment, a sharing settings prediction module **220***a* is included in the social network server **101** is operable on the social network server **101**. In another embodiment, the sharing settings prediction module **220***b* is included in the third party application server **107** and is operable on the third party application server **107**. In another embodiment, the sharing settings prediction module **220***c* is included in the user application server **130***a*/**130***b*/**130***n* and is operable on the user application server **130***a*/**130***b*/**130***n*. Persons of ordinary skill in the art will recognize that the sharing settings prediction module **220** can be stored in any combination on the devices and servers. In some embodiments the sharing settings prediction module **220***a*/**220***b*/**220***c* includes multiple, distributed modules that cooperate with each other to perform the functions described below. Details describing the functionality and components of the sharing setting module **220***a* of the social network server are explained in further detail below with regard to FIG. **3**.

In the illustrated embodiment, the user devices **115***a*, **115***b*, **115***n* are coupled to the network **105** via signal lines **108** and **112**, respectively. The user **125***a* is communicatively coupled to the user device **115***a* via signal line **116**. Similarly, the user device **115***b* is coupled to the network via signal line **112**. The user **125***b* is communicatively coupled to the user device **115***b* via signal line **114**. The third party application **107** is communicatively coupled to the network **105** via signal line **106**. The social network server **101** is communicatively coupled to the network **105** via signal line **104**. In one embodiment, the social network server **101** is communicatively coupled to data storage **110** via signal line **102**. The user application servers **130***a*, **130***b* are coupled to the network **105** via signal lines **132**, **134**, respectively.

In one embodiment, data storage **110** stores data and information of users **125***a*/**125***n* of the social network system **100**. Such stored information includes user profiles and other information identifying the users **125***a*/**125***n* of the social network system **100**. Examples of information identifying users includes, but is not limited to, the user's name, contact information, sex, relationship status, likes, interests, links, education and employment history, location, political views, and religion. In one embodiment, the information stored in data storage **110** also includes the user's list of current and past contacts and the user's activities within the social network system **100**, such as anything the user posts within the social network system **100** and any messages that the user sends to other users. In another embodiment, which is discussed below, a storage device **214** (see FIG. **2**) is included in the social network server **101** and the storage device **214** stores the data and information of users **125***a*/**125***n* of the social network system **100**.

In one embodiment, the user device **115***a*, **115***b*, **115***n* is an electronic device having a web browser for interacting with the social network server **101** via the network **105** and is used by user **125***a*, **125***b*, **125***n* to access information in the social network system **100**. The user device **115***a*, **115***b*, **115***n* can be, for example, a laptop computer, a desktop computer, a tablet computer, a mobile telephone, a personal digital assistant (PDA), a mobile email device, a portable game player, a portable music player, a portable music player, or any other electronic device capable of accessing a network.

In one embodiment, the user application servers **130***a*, **130***b* are servers that provides various services. Specifically, the user application servers **130***a*, **130***b* are servers that enable users of the social network system **100** to share information with other users of the social network system **100**. For example, user applications servers **130***a*, **130***b*, **130***n* are servers that provide services such as the following: social networking; online blogging; organizing online calendars; creating, editing and sharing online calendars; sharing pictures; email services; creating and sharing websites; online chatting; sharing videos; and any other services that allow users to display and present information on the network **105**. For example, in one embodiment, user application server **130***a* is a second social network server; user application server **130***b* is a third social network server; and user application server

130*n* is a fourth social network server. To illustrate in another example, according to another embodiment, the user applications server **130***a* is an email server; user applications server **130***b* is a photo sharing server; and user applications server **130***n* is a second social network server.

Social Network Server **101**

FIG. **2** is a block diagram of an embodiment of a social network server **101**. As illustrated in FIG. **2**, social network server **101** includes a network adapter **202** coupled to a bus **204**. According to one embodiment, also coupled to the bus **204** are at least one processor **206**, memory **208**, a social network module **209**, a graphics adapter **210**, an input device **212**, a storage device **214**, and a sharing settings module **220***a*. In one embodiment, the functionality of the bus **204** is provided by an interconnecting chipset. The social network server **101** also includes a display **218**, which is coupled to the graphics adapter **210**.

The processor **206** may be any general-purpose processor. The processor **206** comprises an arithmetic logic unit, a microprocessor, a general purpose controller or some other processor array to perform computations, provide electronic display signals to display **218**. The processor **206** is coupled to the bus **204** for communication with the other components of the social network server **101**. Processor **206** processes data signals and may comprise various computing architectures including a complex instruction set computer (CISC) architecture, a reduced instruction set computer (RISC) architecture, or an architecture implementing a combination of instruction sets. Although only a single processor is shown in FIG. **2**, multiple processors may be included. The social network server **101** also includes an operating system executable by the processor such as but not limited to WINDOWS®, MacOS X, Android, or UNIX® based operating systems.

The memory **208** stores instructions and/or data that may be executed by processor **206**. The memory **208** is coupled to the bus **204** for communication with the other components via signal line **238**. The instructions and/or data may comprise code for performing any and/or all of the techniques described herein. The memory **208** may be a dynamic random access memory (DRAM) device, a static random access memory (SRAM) device, flash memory or some other memory device known in the art. In one embodiment, the memory **208** also includes a non-volatile memory or similar permanent storage device and media such as a hard disk drive, a floppy disk drive, a CD-ROM device, a DVD-ROM device, a DVD-RAM device, a DVD-RW device, a flash memory device, or some other mass storage device known in the art for storing information on a more permanent basis.

The social network module **209** is software and routines executable by the processor **206** to control the interaction between the social network system **101**, storage device **214** and the user device **115***a*, **115***b*, **115***n*. An embodiment of the social network module **209** allows users **125***a*, **125***b*, **125***n* of user devices **115***a*, **115***b*, **115***n* to perform social functions between other users **125***a*, **125***b*, **125***n* of user devices **115***a*, **115***b*, **115***n* within the social network system **100**.

The storage device **214** is any device capable of holding data, like a hard drive, compact disk read-only memory (CD-ROM), DVD, or a solid-state memory device. The storage device **214** is a non-volatile memory device or similar permanent storage device and media. The storage device **214** stores data and instructions for processor **208** and comprises one or more devices including a hard disk drive, a floppy disk drive, a CD-ROM device, a DVD-ROM device, a DVD-RAM device, a DVD-RW device, a flash memory device, or some other mass storage device known in the art. In one embodiment, the storage device **214** is used to store user profiles and other information identifying users **125***a*/**125***n* of the social network system **100**. In some embodiments, such user data is stored in data storage **110**.

The input device **212** may include a mouse, track ball, or other type of pointing device to input data into the social network server **101**. The input device **212** may also include a keyboard, such as a QWERTY keyboard. The input device **212** may also include a microphone, a web camera or similar audio or video capture device. The graphics adapter **210** displays images and other information on the display **218**. The display **218** is a conventional type such as a liquid crystal display (LCD) or any other similarly equipped display device, screen, or monitor. The display **318** represents any device equipped to display electronic images and data as described herein. The network adapter **202** couples the social network server **101** to a local or wide area network.

The sharing settings prediction module **220***a* is software and routines executable by the processor **206** to predict one or more of a user's desired sharing settings based on an analysis of the user's relevant data. An embodiment of the sharing settings prediction module **220***a* is software and routines executable by the processor **206** to predict one or more of a user's desired sharing settings based on an analysis of the user's relevant data. Details describing the functionality and components of the sharing settings prediction module **220***a* are explained in further detail below with regard to FIG. **3**.

As is known in the art, a social network server **101** can have different and/or other components than those shown in FIG. **2**. In addition, the social network server **101** can lack certain illustrated components. In one embodiment, a social network server **101** lacks an input device **212**, graphics adapter **210**, and/or display **218**. Moreover, the storage device **214** can be local and/or remote from the social network server **101** (such as embodied within a storage area network (SAN)).

As is known in the art, the social network server **101** is adapted to execute computer program modules for providing functionality described herein. As used herein, the term "module" refers to computer program logic utilized to provide the specified functionality. Thus, a module can be implemented in hardware, firmware, and/or software. In one embodiment, program modules are stored on the storage device **214**, loaded into the memory **208**, and executed by the processor **206**.

Embodiments of the entities described herein can include other and/or different modules than the ones described here. In addition, the functionality attributed to the modules can be performed by other or different modules in other embodiments. Moreover, this description occasionally omits the term "module" for purposes of clarity and convenience.

Sharing Settings Prediction Module **220**

Referring now to FIG. **3**, the sharing setting prediction module **220***a* is shown in more detail. In another embodiment, the third party application server **107** includes the sharing settings module **220***b*. In one embodiment, the sharing settings module **220***a* is software and routines executable by the processor **206** to predict one or more of a user's desired sharing settings based on an analysis of the user's relevant data.

In one embodiment, the sharing settings module **220***a* comprises a relevant data retrieval engine **302**, and a sharing settings prediction engine **304**, an optional prediction notification engine **306**, an optional algorithm adjustment engine **308**, and an optional settings adjuster engine **310**.

The relevant data retrieval engine **302** is software and routines executable by the processor for receiving relevant data and sending the relevant data to the sharing settings prediction engine **304**. Relevant data is data that is received by the

relevant data retrieval engine **302** for analysis by the sharing settings prediction engine **304** discussed below. In one embodiment, the relevant data retrieval engine **302** is a set of instructions executable by a processor to provide the functionality described below for receiving relevant data. In another embodiment, the relevant data retrieval engine **302** is stored in memory of the social network server **101** and is accessible and executable by the processor. In either embodiment, the relevant data retrieval engine **302** is adapted for cooperation and communication with the processor and other components of the social network server **101**.

According to one embodiment, the relevant data retrieval engine **302** is communicatively coupled to the storage device **214**. The relevant data retrieval engine **302** is also communicatively coupled, via the sharing settings prediction module **220***a* of the social network server **101** to user application servers **130***a*, **130***b*, and **130***n*. In one embodiment, the relevant data retrieval engine **302** receives data from the user application servers **130***a*, **130***b*, and **130***n*. According to one embodiment, the relevant data retrieval engine **302** is communicatively coupled, via the sharing settings prediction module **220***a* of the social network server **101** to the data store **110**. In one embodiment, the relevant data retrieval engine **302** receives data from the data store **110**. In some embodiments, data is received from other applications, such as data stored in user application servers **130***a*/**130***b*/**130***n*. In some embodiments, the other applications are other social network servers. In such embodiments, examples of data received includes, but is not limited to, user sharing data including frequency of use of the application and the scope of communication within the applications or social network servers.

The sharing settings prediction engine **304** is software and routines executable by the processor for analyzing the received relevant data and predicting one or more of the user's desired sharing settings based an analysis of that relevant data. In one embodiment, the sharing settings prediction engine **304** is a set of instructions executable by a processor to provide the functionality described below for analyzing relevant data and predicting one or more of the user's desired sharing settings based on that relevant data. In another embodiment, the sharing settings prediction engine **304** is stored in the memory **208** of the social network server **101** and is accessible and executable by the processor **206**. In either embodiment, the sharing settings prediction engine **304** is adapted for cooperation and communication with the processor and other components of the social network server **101**.

In one embodiment, sharing settings are embodied in levels. Each level corresponds to various sharing settings for an attribute. According to one embodiment, an attribute is a type of information in an application associated with a user of the social network system **100**. For example, an attribute may be a type of information in an application to be displayed to other within the social network system **100**, such as the user's name. As another example, another feature is the user's profile picture. Another example of an attribute is the user's address. An attribute may also be sharing setting of a user of the social network system **100**.

According to one embodiment, the sharing settings are divided into three levels which are low, medium, and high. A low level applies permissive sharing settings to the feature making all or most of the information contained in the feature available to all the users of the system **100**. A medium level applies moderate sharing settings to the feature making the information contained in the feature available to direct connections of the user. A high level applies stringent sharing settings to the feature and makes the information contained in the feature available to only the user. The foregoing is an example of how sharing setting levels correlate with access to information associated with an attribute. Other embodiments can include different and or additional protection levels and different associated sharing settings. As described in this embodiment, three levels of sharing protection are shown. However, in other embodiments, there can be any number of sharing protection levels.

In one embodiment, the sharing settings prediction engine **304** utilizes one or more algorithms to analyze the relevant data. In one such embodiment, one or more algorithms are based on common sense assumptions about sharing settings preference in regards to one or more user characteristics. For example, if the user is a girl in her early teens whose photographs are frequently accessed by much older men that are not friends of the girl, in one embodiment, a common sense assumption is that such access is undesirable. In one such embodiment, the sharing settings prediction engine **304** predicts that the user desires a sharing setting other than a low-level setting for features associated with photograph sharing in order to prohibit such access.

In another such embodiment, one or more of the algorithms utilize aggregate statistics, which can demonstrate one or more themes in a population based on the presence of a certain characteristic or set of characteristics. For example, a fictional aggregate statistic is that 70% of married social network users over age 50 share their photographs only with their friends and family. In the example, the theme is photograph sharing; the population is social network users; and the set of characteristics is married and over 50 years of age. In the example, in one embodiment, if the sharing settings prediction engine **304** analyzed the user's data and found that the user was over 50 years of age and married the sharing settings prediction engine **304** predicts that the user desires medium-level sharing protection. In one embodiment, the aggregate statistics are generated at least in part by a statistical analysis of the users and user accounts of the social network system **100**.

In yet another such embodiment, one or more algorithms used by the sharing settings prediction engine **304** analyze the relevant data using statistical weighting, which can emphasize, or diminish, the effect of a variable on the result of the algorithm. For example, in one embodiment, the sharing settings prediction engine **304** analyzes the user's sharing settings for other sites and applications, and the user's demographic. In this example, the user's sharing settings for all the other sites and applications are the default sharing setting for those sites and applications. In one embodiment, the usefulness of these default sharing settings in predicting one or more of the desired sharing settings is inconclusive. The default sharing settings may represent the settings the user actually desires or they may be the result of the user neglecting to personalize the sharing settings. In this example, in one embodiment, the algorithm used by the sharing settings prediction engine **304** gives less statistical weight to the user's sharing settings for other sites and applications because of their inconclusive usefulness for predicting one or more of the user's desired sharing settings. Therefore, more statistical weight is assigned to the user's demographics thereby predicting the user's desired sharing settings predominantly based on the user's demographic in accordance with one embodiment. In one embodiment, one or more of the algorithms can be modified by user feedback described below.

According to one embodiment, the sharing settings prediction engine **304** analyzes and predicts one or more of the user's desired sharing settings based on relevant data associated with the user's sharing settings on other websites and applications. In one such embodiment, the sharing settings

prediction engine **304** analyzes the user's other sharing settings for the presence and the nature of consistencies then predicts one or more of the user's desired sharing settings based on that analysis. For example, in one embodiment, if the analysis reveals the user's other sites and applications exhibit predominantly high-level sharing settings, the sharing settings prediction engine **304** predicts that the user desires high-level settings on the social network **101**.

According to one embodiment, the sharing settings prediction engine **304** analyzes the user's relevant data and predicts one or more of the user's desired sharing settings based on relevant data associated with the user's online usage. Online usage includes, but is not limited to, the posting, tagging, blogging, micro-blogging and other sharing by the user whether on the social network **100** or on another site or application. In one such embodiment, the sharing settings prediction engine **304** analyzes the user's online usage for frequency, content, and scope of the user's sharing. For example, in one embodiment, if analysis reveals the user regularly maintains a public blog under the user's actual name, the sharing settings prediction engine **304** predicts that the user desires low-level sharing settings, because there is high frequency, the blog contains the user's actual information (name), and the blog is publicly accessible.

According to one embodiment, the sharing settings prediction engine **304** analyzes and predicts one or more of the user's desired sharing settings based on relevant data associated with the sharing settings of one or more of the user's contacts on the social network. In one such embodiment, the sharing settings prediction engine **304** analyzes the sharing settings of one or more of the user's contacts for consistencies and the nature of those consistencies. For example, in one embodiment, if the user's contacts predominantly use high-level sharing settings, the sharing settings prediction engine **304** predicts that the user desires high-level sharing settings. In one embodiment, the sharing settings prediction engine **304** analyzes the user's close contact, or contacts.

According to one embodiment, the sharing settings prediction engine **304** analyzes and predicts one or more of the user's desired sharing settings based on relevant data regarding the user's demographic. In one embodiment, the user's demographic includes information about the user's age, which is submitted by the user. For example, in one embodiment, if aggregate statistics indicate that users in their late teens or early twenties prefer low-level sharing settings, the sharing settings prediction engine **304** predicts that a twenty year-old user desires low-level sharing settings. In another embodiment, the user's demographic information includes the user's gender, which is submitted by the user. For example, in one embodiment, if aggregate statistics indicate that male users prefer low-level sharing settings, the sharing settings prediction engine **304** predicts that a male user desires low-level sharing settings. In another embodiment, the user's demographic information includes the user's education, which is submitted by the user. For example, in one embodiment, if aggregate statistics indicate that users with post graduate degrees desire high-level sharing settings, the sharing settings prediction engine **304** predicts that a user with a post grad degree desires high-level sharing settings. In another embodiment, the user's demographic information includes the user's profession, which is submitted by the user. For example, in one embodiment, if aggregate statistics indicate that users in the hospitality industry desire medium-level sharing settings, the sharing settings prediction engine **304** predicts that a user who works as a tour guide desires medium-level sharing settings. In another embodiment, the user's demographic information includes the user's relationship status, which is submitted by the user. For example, in one embodiment, if aggregate statistics indicate that married users desire medium-level sharing settings, the sharing settings prediction engine **304** predicts that a married user desires medium-level sharing settings. In another embodiment, the user's demographic information includes the user's geographic location. For example, in one embodiment, if aggregate statistics indicate that users in New England desire low-level sharing settings, the sharing settings prediction engine **304** predicts that a user in Massachusetts desires low-level sharing settings.

According to one embodiment, the sharing settings prediction engine **304** analyzes and predicts one or more of the user's desired sharing settings based on relevant data regarding the user's characteristics. In one embodiment, the user's characteristics data is the results of a quiz or questionnaire the user answers. For example, in one embodiment, if common sense indicates that users identified by a quiz as extraverted does not desire high-level sharing settings, the sharing settings prediction engine **304** predicts that a user who takes the quiz and is identified as extraverted desires sharing settings other than high-level. In another embodiment, the characteristics data is the results of a puzzle or game the user played, which provides insight into the user's characteristics. For example, a person who plays Sudoku may be introverted and perhaps prefer higher-level sharing settings. It should be noted that personality traits are just one of many user characteristics that can be inferred. For example, in one embodiment, the user's acceptance of technology may be inferred. If a user discloses on a quiz, for example, that the user has many online accounts and spends many hours a day online or on a social network site, it may be inferred that the user is comfortable with sharing information online and prefers lower-level sharing settings. In another embodiment, characteristics data is associated with the user's e-mail and calendar and the user's interaction preferences are inferred. For example, in one embodiment, a user who corresponds by e-mail frequently, but does not have many meetings or face-to-face appointments in his or her calendar the sharing settings prediction engine **304** predicts that the user desires low-level sharing settings, since the user's preferred method of interaction is electronic.

According to one embodiment, the sharing settings prediction engine **304** analyzes and predicts one or more of the user's desired sharing settings based on relevant data regarding other users or applications accessing the user's features. For example, in one embodiment, if it is a common sense assumption that users whose features are frequently accessed by applications other than the applications the users use desire medium-level sharing settings which prohibits such use, the sharing settings prediction engine **304** predicts that the user desires medium-level sharing settings.

In one embodiment, the sharing settings prediction engine **304** predicts one or more of the user's desired sharing settings by selection. For example, in one such embodiment, the sharing settings prediction engine **304** predicts that a married, sixty-year-old lawyer desires high-level sharing protection. In another embodiment, the sharing settings prediction engine **304** predicts one or more of the user's desired sharing settings by elimination. For example, in one such embodiment, the sharing settings prediction engine **304** predicts that a married, sixty-year-old lawyer does not desire low-level sharing protection.

According to one embodiment, the sharing settings prediction engine **304** predicts the user's desired sharing setting for each individual feature. For example, in one embodiment, the sharing settings prediction engine **304** analyzes the user's

relevant data and predicts that the user desires a low-level sharing setting for the user's profile picture, a medium-level sharing setting for the user's posts, a high-level sharing setting for the user's address, a low-level sharing setting for the user's e-mail address, and a high-level sharing setting for the user's photographs. In another embodiment, the sharing settings prediction engine **304** predicts the user's desired sharing setting based on groups of features. For example, in one embodiment, the sharing settings prediction engine **304** analyzes the same user's relevant data and predicts, perhaps utilizing statistical weighting, that the user desires medium-level sharing settings for features associated with biographical information or posts and high-level sharing settings for features associated with photographs. In another embodiment, a plurality of user categories is defined based on user characteristics. Each user category is associated with the sharing settings predicted to be desired by a user fitting that user category. In one such embodiment, the sharing settings prediction engine **304** analyzes the user's relevant data and categorizes the user, which predicts the user's desired sharing settings are those associated with that user category.

Some embodiments of the sharing settings prediction module **220** also include a prediction notification engine **306**. The prediction notification engine **306** is software and routines executable by the processor for notifying the user of the sharing settings prediction engine's **304** one or more predicted sharing settings. In one embodiment, the prediction notification engine **306** is a set of instructions executable by a processor to provide the functionality described below for notifying the user of the sharing settings prediction engine's **304** one or more predicted sharing settings. In another embodiment, the prediction notification engine **306** is stored in memory of the social network server **101** and is accessible and executable by the processor. In either embodiment, the prediction notification engine **306** is adapted for cooperation and communication with the processor and other components of the social network server **101**.

The prediction notification engine **306** receives the predicted sharing settings from the sharing settings prediction engine **304**, generates a prediction including a suggestion for a desired sharing setting, and sends the prediction for display to the user. In one embodiment, the prediction is displayed as a pop-up. In another embodiment, the prediction is an e-mail or message to the user. In one embodiment, the prediction is displayed on the page where sharing settings are normally set or displayed. In yet another embodiment, the prediction is another webpage. Other embodiments may use other forms of display.

In one embodiment, the prediction notification engine **306** compares the user's predicted sharing settings to the user's current sharing settings. In one embodiment, the prediction notification engine **306** generates a prediction only if one or more of the user's current sharing settings differ from the sharing setting predicted by the sharing settings prediction engine **304**. In one embodiment, the prediction notifies the user specifically which feature, or features, have sharing settings different from those predicted by the sharing settings prediction engine **304**. In one embodiment, the prediction includes the one or more sharing settings predicted by the sharing settings prediction engine **304** as suggestions for desired sharing settings. In one such embodiment, the prediction includes suggestions for desired sharing settings only for the sharing settings where the user's current setting differs from the predicted setting. In one embodiment, the prediction notification engine **306** notifies the user why, or based on what relevant data, one or more of the predicted sharing settings is based on. For example, in one embodiment, the notification could read "It is recommended that you change the sharing settings for your biographical information from low to medium due to repeated access by third-party applications."

Some embodiments of the sharing settings prediction module **220** also include an algorithm adjustment engine **308**. The algorithm adjustment engine **308** is software and routines executable by the processor for changing one or more of the algorithms used by the sharing settings prediction engine **304** based on user feedback. In one embodiment, the algorithm adjustment engine **308** is a set of instructions executable by a processor to provide the functionality described below for changing one or more of the algorithms used by the sharing settings prediction engine **304** based on user feedback. In another embodiment, the algorithm adjustment engine **308** is stored in memory of the social network server **101** and is accessible and executable by the processor. In either embodiment, the algorithm adjustment engine **308** is adapted for cooperation and communication with the processor and other components of the social network server **101**.

In one embodiment, user feedback is obtained when the user rejects one or more of the predicted sharing settings by either declining to accept the predicted sharing setting, or changing the sharing setting from the predicted sharing setting. In one embodiment, the rejection of one or more predicted sharing settings is feedback in and of itself. In one embodiment, the feedback is the user's response, or responses, to one or more questions submitted to the user regarding the reason, or reasons, the user prefers a non-predicted sharing setting. In one embodiment, the user's feedback adjusts one or more aggregate statistics used in one or more algorithms. In one embodiment, the user's feedback adjusts one or more statistical weighting factors used in one or more algorithms.

The settings adjuster engine **310** is software and routines executable by the processor for adjusting the user's sharing settings to the settings predicted by the sharing settings prediction engine **304**. In one embodiment, the settings adjuster engine **310** is a set of instructions executable by a processor to provide the functionality described below for adjusting the user's sharing settings to the settings predicted by the sharing settings prediction engine **304**. In another embodiment, the settings adjuster engine **310** is stored in memory of the social network server **101** and is accessible and executable by the processor. In either embodiment, the settings adjuster engine **310** is adapted for cooperation and communication with the processor and other components of the social network server **101**.

In one embodiment, the settings adjuster engine **310** receives the predicted sharing settings from the sharing settings prediction engine **304** and adjusts the user's sharing settings to the predicted sharing settings. In another embodiment, the settings adjuster engine **310** receives the predicted sharing settings from the prediction notification engine **306** and adjusts the user's sharing settings to the predicted sharing settings. In one embodiment, for any adjustments to occur the user must accept one or more of the predicted sharing settings and only the sharing settings for the accepted predicted sharing settings are adjusted. In another embodiment, the user's sharing settings are automatically adjusted to the predicted sharing settings without user action or approval. In one embodiment, the user's sharing settings are only automatically adjusted to the predicted sharing settings without user action, or approval, if the predicted sharing setting is more stringent than the user's current sharing setting.

FIG. **8** illustrates an example of a storage device **214** storing user aggregate statistics **800** data and user data **802**

including data belonging to User-A **810***a* according to one embodiment. In this example, the User-A data **810***a* includes data regarding User-A's demographic **820***a* and User-A's sharing settings **820***b*. In one embodiment, User-A's demographic data **820***a* includes user submitted information regarding User-A's age **830***a*, gender **830***b*, profession **830***c*, and other demographic information **830***n*. The user aggregate statistics data **800** includes statistics data regarding the users of the social network system **100** including user demographic statistics **840***a*, user sharing settings statistics **840***b*, and other statistics data **840***n* according to one embodiment. In this example, the sharing settings statistics data **840***b* contains statistical data regarding user sharing settings by age **850***a*, gender **850***b*, profession **850***c*, and other sharing settings statistics. In one embodiment, the sharing settings prediction engine **304** analyzes the User A's demographic data **820***a* and predicts User A's desired sharing settings using algorithms involving aggregate statistics data for users sharing settings **840***b*.

In some implementations, the user may opt in/out of participating in such data collection activities. Furthermore, the collected data can be anonymized prior to performing the analysis to obtain the various statistical patterns described above.

As mentioned above, in one embodiment, the sharing settings prediction module **220***c* is included in the user application server **130***a*/**130***b*/**130***n* and is operable on the user application server **130***a*/**130***b*/**130***n*.

Method

Referring now to FIG. **4**, a flow chart illustrating an embodiment of a method **400** for predicting one or more of a user's desired sharing settings based on an analysis of the user's relevant data is shown.

The relevant data retrieval engine **302** of the sharing settings prediction module **220***a* obtains the relevant data **402**. As discussed above, relevant data is data used to predict one or more of the user's desired sharing settings and includes, but is not limited to, data regarding the user's sharing settings for other sights and applications, the user's contacts' sharing settings, sharing setting of similar users, user's demographic information, user's online usage, user's characteristics, and data regarding which other users are accessing which of the user's features. The sharing settings prediction engine **304** receives the relevant data from the relevant data retrieval engine **302**. The sharing settings prediction engine **304** analyzes the relevant data and predicts one or more of the user's desired sharing settings **404** based on the analysis of that relevant data.

Referring now to FIG. **5**, a flow chart illustrating a method **500** for analyzing the user's relevant data and predicting one or more of the user's desired sharing settings is shown in accordance with one embodiment. It will be clear to a person having ordinary skill in the art that this is just one embodiment. Other embodiments may use any of the analysis methods in FIG. **5** alone or in combination. Other embodiments may also include analysis methods in addition to or different from those of FIG. **5**. The sharing settings prediction engine **304** analyzes the user's sharing settings for other sites and applications **502**. In one embodiment, the sharing settings prediction engine **304** then analyzes the user's online usage **504**.

Referring now to FIG. **6**, a flow chart illustrating a method **600** for analyzing the user's online usage is shown in accordance with one embodiment. The sharing settings prediction engine **304** analyzes the features, applications, and websites the user uses **602** according to one embodiment. For example, if the user has a blog or micro-blog **604**(Yes), the sharing settings prediction engine **304** analyzes the user's blogging data **606** including interactions with the blogging data (e.g., editing, commenting, reposting and sharing). In one embodiment, once the blogging data are analyzed **606**, or if the user does not blog or micro-blog **604**(No), the sharing settings prediction engine **304** analyzes whether the user shares features **608**. If the user tags photos, posts messages, or otherwise shares features **608**(Yes), the sharing settings prediction engine **304** analyzes how frequently the user shares features **610**, what features the user is sharing **612**, and who the user shares these features with **614** according to one embodiment.

Referring again to FIG. **5**, in one embodiment, the sharing settings prediction engine **304** analyzes the sharing settings of the user's contacts **506**. The sharing settings prediction engine **304** then analyzes sharing settings of similar users **507**. In such embodiments, the sharing settings prediction engine **304** determines similarity of users based on information about the users, for example, information related to user demographics, sharing usage, and social network activity. The sharing settings prediction engine **304** then analyzes the user's demographic **508** according to one embodiment.

Referring now to FIG. **7**, a flow chart illustrating a method **700** for analyzing the user's demographic is shown in accordance with one embodiment. It will be clear to a person having ordinary skill in the art that this is just one embodiment. Other embodiments may use any of the analysis methods in FIG. **7** alone or in combination. Other embodiments may also include analysis methods in addition to or different from those of FIG. **7**. According to one embodiment, the sharing settings prediction engine **304** analyzes the user's age **702**, gender **704**, education **706**, profession **708**, relationship status **710**, and geographic location **712**.

Referring again to FIG. **5**, the sharing settings prediction engine **304**, according to one embodiment, then analyzes the user's characteristics **510**. As discussed above, the user's characteristics can be analyzed any number of ways, including, but not limited to, questionnaires, puzzles, or games or application and website usage. The sharing settings prediction engine **304** then analyzes what other users and applications are accessing the user's features and which features they are accessing **512** according to one embodiment. According to one embodiment, the sharing settings prediction engine **304** predicts one or more of the user's desired sharing settings **514** based on the foregoing analysis. As discussed above, in some embodiments, the sharing settings prediction engine **304** predicts the user's one or more desired sharing settings using one or more algorithms (not shown). In one embodiment, one or more algorithms rely on aggregate statistics. In one embodiment, one or more algorithms use statistical weighting. In one embodiment, the sharing settings prediction engine **304** predicts one or more of the user's desired sharing settings by selection. In another embodiment, the sharing settings prediction engine **304** predicts one or more of the user's desired sharing settings by elimination.

Referring again to FIG. **4**, according to some embodiments, the method includes generating **406** a prediction including a suggestion for a desired sharing setting, and sending **408** the prediction for display to the user. The prediction notification engine **306** notifies the user of the sharing settings predicted **404** by the sharing settings prediction engine **304**. As mentioned above, the prediction can be displayed in any number of places including, but not limited to, an e-mail, a pop-up, a separate webpage, or where the sharing settings are typically set or displayed. The prediction can include various amount of detail including, but not limited to, whether any of the user's sharing settings differ from those predicted **404**, one or more of the user's current settings, one or more of the

user's predicted **404** sharing settings, how the user can accept or adjust the sharing settings, if the sharing settings have already been adjusted, and on what basis one or more predictions **404** were made. In one embodiment the predicted **404** sharing settings are the suggested sharing settings in the generated **406** prediction. In one embodiment, the user's sharing settings are automatically adjusted (not shown) based on the generated **406** prediction rather than sending **408** the prediction for display. According to one embodiment, the user is given the option to accept or reject one or more of the suggested desired sharing settings **410**.

According to some embodiments, if one or more of the predicted sharing settings is rejected **410** (Yes), one or more of the algorithms used by the sharing settings prediction engine **304** are adjusted **414** based on the user's feedback. As discussed above, the user's feedback can include the rejection of the predicted sharing setting alone, or can include additional information, such as the user's response to questions regarding the user's preference for a non-predicted sharing setting. In some embodiments, the statistical weighting factors in the algorithms are adjusted based on the feedback. In some embodiments, the aggregate statistics used by the algorithm are adjusted based on the feedback. In some embodiments, after adjusting **414** one or more of the algorithms the user's relevant data is analyzed and the users desired sharing settings are predicted **404** again using the adjusted algorithms. In one embodiment, the cycle of analyzing user's relevant data and predicting the user's desired sharing settings **404**, generating a prediction **406**, sending the prediction for display **408**, and adjusting **414** the algorithms is repeated until the user accepts one or more of the predicted sharing settings **410** (No).

According to some embodiments, the method includes adjusting one or more of the user's sharing settings **412** to one or more of the predicted sharing settings. The settings adjuster engine **308** adjusts one or more of the user's sharing settings **410** to one or more of the sharing settings predicted **404** by the sharing settings prediction engine **304** and suggested in the generated **406** prediction. As mentioned above, in one embodiment, the settings adjuster engine **310** automatically adjusts the user's sharing settings **412** to those predicted by the sharing settings prediction engine **304** without user action or permission. In some such embodiments, the sharing settings are only adjusted **412** if the predicted sharing settings are more stringent than the user's current sharing settings. In one embodiment, the user must accept **410**(No) one or more of the predicted sharing settings and only the predicted sharing settings accepted **410**(No) by the user are adjusted **412**.

Graphical User Interface

FIG. **9** is a graphic representation of an example of a user interface **900** displaying a user's social networking page **902**. In one embodiment, the user's sharing settings **904** are normally displayed under the sharing settings tab of user options. In one embodiment, the sharing settings **904** include a table displaying the features **906**, the user's current sharing setting associated with each feature **908**, and the predicted sharing settings **910** for each feature. According to one embodiment, the user is notified when a user's sharing setting differs from the predicted sharing settings. In one embodiment, this notification is visual. For example, highlighting **912** one or more features **906** whose current setting **908** differs from the predicted setting **910**. In one embodiment, the user must choose to accept the predicted sharing preference **910** before the user's current setting **908** is adjusted to match. In one embodiment, the predicted sharing settings can be accepted or rejected for each feature individually. In one embodiment, acceptance or rejection of the predicted sharing settings is done in the same location as the notification of the predicted sharing settings **904**. In one embodiment, the acceptance is done by clicking on a button **914**. Acceptance of the predicted sharing setting automatically adjusts the user's current sharing setting **908** to the predicted sharing setting **910** according to one embodiment.

The foregoing description of the embodiments has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the embodiments to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. It is intended that the scope of the embodiments be limited not by this detailed description, but rather by the claims of this application. As will be understood by those familiar with the art, the embodiments may take other specific forms without departing from the spirit or essential characteristics thereof. Likewise, the particular naming and division of the modules, routines, features, attributes, methodologies and other aspects are not mandatory or significant, and the mechanisms that implement one embodiment or its features may have different names, divisions and/or formats. Furthermore, as will be apparent to one of ordinary skill in the relevant art, the modules, routines, features, attributes, methodologies and other aspects of the embodiments can be implemented as software, hardware, firmware or any combination of the three. Also, wherever a component, an example of which is a module, is implemented as software, the component can be implemented as a standalone program, as part of a larger program, as a plurality of separate programs, as a statically or dynamically linked library, as a kernel loadable module, as a device driver, and/or in every and any other way known now or in the future to those of ordinary skill in the art of computer programming. Additionally, the embodiments are in no way limited to implementation in any specific programming language, or for any specific operating system or environment. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope, which is set forth in the following claims.

What is claimed is:

1. A computer-implemented method for predicting one or more sharing settings for a user, the method comprising:

receiving unrated, relevant user data, wherein the unrated, relevant user data includes data associated with a user of a social network system and data regarding sharing settings of other users;

analyzing the unrated, relevant user data to determine a preferred level of sharing of the user based on the analysis of the unrated, relevant user data;

generating one or more predictions, wherein the prediction includes a suggestion of a desired sharing setting that controls which other users of the social network system are able to access what portion of the user's information within the social network system, the suggestion of the desired sharing setting based on the analyzed unrated, relevant user data and the determined preferred level of sharing; and

sending the one or more predictions for display.

2. The method of claim **1**, wherein the unrated, relevant user data comprises the user's sharing settings for one or more other sites or other applications.

3. The method of claim **1**, wherein the unrated, relevant user data comprises information regarding the user's online usage.

4. The method of claim **1**, wherein the data regarding sharing settings of other users comprises the sharing settings of one or more similar users.

5. The method of claim 1, wherein the unrated, relevant user data comprises the user's demographic information.

6. The method of claim 1, wherein the unrated, relevant user data comprises information regarding the user's characteristics.

7. The method of claim 1, wherein the unrated, relevant user data comprises information regarding what other users and applications access which of the user's features.

8. The method of claim 1, wherein the analysis, the predicting sharing settings, or both use statistical weighting.

9. The method of claim 1, the method further comprising:

comparing one or more predictions to the user's current sharing settings.

10. The method of claim 9, the method further comprising:

notifying the user of the results of the comparison between the one or more predictions and the user's current sharing settings.

11. The method of claim 1, the method further comprising:

adjusting one or more of the user's sharing settings according to the one or more predictions.

12. The method of claim 10, the method further comprising:

receiving feedback from the user wherein the user accepts or rejects one or more of the predictions.

13. The method of claim 12, wherein the feedback adjusts one or more of the algorithms used for analyzing the user's unrated, relevant data, predicting sharing settings, or both.

14. A computer-implemented method for predicting one or more sharing settings for a user, the method comprising:

receiving unrated, relevant user data, wherein the unrated, relevant user data includes data associated with a user of a social network system and data regarding sharing settings of other users;

analyzing the unrated, relevant user data to determine a preferred level of sharing of the user based on the analysis of the unrated, relevant user data;

predicting one or more predictions of desired sharing settings of the user that control which other users of the social network system are able to access what portion of the user's information within the social network system, the one or more predictions of desired sharing settings of the user based on the analyzed unrated, relevant user data and determined preferred level of sharing; and

automatically adjusting the user's sharing settings according to the one or more predictions.

15. A system for predicting one or more sharing settings for a user, the system comprising:

a processor, and at least one module, stored in the memory and executed by the processor, the at least one module including instructions for:

receiving unrated, relevant user data, wherein the unrated, relevant user data includes data associated with a user of a social network system and data regarding sharing settings of other users;

analyzing the unrated, relevant user data to determine a preferred level of sharing of the user based on the analysis of the unrated, relevant user data;

generating one or more predictions, wherein the prediction includes a suggestion of a desired sharing setting that controls which other users of the social network system are able to access what portion of the user's information within the social network system, the suggestion of the desired sharing setting based on the analyzed unrated, relevant user data and the determined preferred level of sharing; and

sending the one or more predictions for display.

16. The system of claim 15, wherein the unrated, relevant user data comprises the user's sharing settings for one or more other sites or other applications.

17. The system of claim 15, wherein the unrated, relevant user data comprises information regarding the user's online usage.

18. The system of claim 15, wherein the data regarding sharing settings of other users comprises the sharing settings of one or more similar users.

19. The system of claim 15, wherein the unrated, relevant user data comprises the user's demographic information.

20. The system of claim 15, wherein the unrated, relevant user data comprises information regarding the user's characteristics.

21. The system of claim 15, wherein the unrated, relevant user data comprises information regarding what other users and applications access which of the user's features.

22. The system of claim 15, wherein the analysis, the predicting sharing settings, or both use statistical weighting.

23. The system of claim 15, the method further comprising:

comparing one or more of the predictions to the user's current sharing settings.

24. The system of claim 23, the method further comprising:

notifying the user of the results of the comparison between the one or more predictions and the user's current sharing settings.

25. The system of claim 15, the method further comprising:

adjusting one or more of the user's sharing settings according to the one or more predictions.

26. The system of claim 23, the method further comprising:

receiving feedback from the user wherein the user accepts or rejects one or more of the predictions.

27. The system of claim 26, wherein a user's feedback adjusts one or more of the algorithms used for analyzing the user's unrated, relevant data, predicting sharing settings, or both.

28. A system for predicting one or more sharing settings for a user, the system comprising:

a processor, and at least one module, stored in the memory and executed by the processor, the at least one module including instructions for:

receiving unrated, relevant user data, wherein the unrated, relevant user data includes data associated with a user of a social network system and data regarding sharing settings of other users;

analyzing the unrated, relevant user data to determine a preferred level of sharing of the user based on the analysis of the unrated, relevant user data;

generating one or more predictions, wherein the prediction includes a suggestion of a desired sharing setting that controls which other users of the social network system are able to access what portion of the user's information within the social network system, the suggestion of the desired sharing setting based on the analyzed unrated, relevant user data and the determined preferred level of sharing; and

automatically adjusting the user's sharing settings according to the one or more predictions.

29. A computer program product comprising a non-transitory computer usable storage medium including a computer readable program, the computer readable program when executed by a processor causes the processor to:

receive unrated, relevant user data, wherein the unrated, relevant user data includes data associated with a user of a social network system and data regarding sharing settings of other users;

analyze the unrated, relevant user data to determine a preferred level of sharing of the user based on the analysis of the unrated, relevant user data;

generate one or more predictions, wherein the prediction includes a suggestion of a desired sharing setting based on the analyzed unrated, relevant user data and the determined preferred level of sharing; and

generate a sharing suggestion display including the one or more predictions, wherein the one or more predictions includes a suggestion of at least one desired sharing setting that controls which other users of the social network system are able to access what portion of the user's information within the social network system.

30. The computer program product of claim **29**, further comprising:

generating at least one current setting for the sharing setting associated with the suggestion of at least one desired sharing setting.

31. A computer program product comprising a non-transitory computer usable storage medium including a computer readable program, the computer readable program when executed by a processor causes the processor to:

receive unrated, relevant user data, wherein the unrated, relevant user data includes on-line activity of the user of a social network system, descriptive information about the user and data regarding sharing settings of other users;

analyze the unrated, relevant user data to determine a preferred level of sharing of the user based on the analysis of the on-line activity of the user and the descriptive information about the user;

generate one or more predictions, wherein the prediction includes a suggestion of a desired sharing setting that controls which other users of the social network system are able to access what portion of the user's information within the social network system, the suggestion of the desired sharing setting based on the analyzed unrated, relevant user data and the determined preferred level of sharing; and

send the one or more predictions for display.

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